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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
MOWLA, GOLAM	
ART UNIT	PAPER NUMBER
1795	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/754,597	TAKEYAMA ET AL.	
	Examiner	Art Unit	
	GOLAM MOWLA	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 April 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 04/24/2008 has been entered.

Response to Amendment

2. Applicant's amendment of 04/24/2008 does not render the case allowable.

3. Claims 1-14 are pending. Applicant has amended claims 1 and 10.

Status of the Objections or Rejections

4. Due to Applicant's amendment of claims 1 and 10, the rejections of claims 1-13 from the office Action mailed on 01/24/2008 are withdrawn. New ground(s) of rejection under 35 U.S.C. 103 is/are necessitated by the amendments.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claim 14 is rejected under 35 U.S.C. 102(b) as being anticipated by Shiotsuka et al. (US 6121542).

With respect to claim 14, Shiotsuka discloses a photovoltaic cell (see fig. 4b, col. 6, lines 40-56) comprising:

- a photovoltaic element (photovoltaic device 402) (fig. 4b; col. 7, lines 45-53); and
- a coating film (407) (fig. 4b; col. 7, line 58 to col. 8, line 4) provided on the photovoltaic element (201),
    - wherein the photovoltaic element (201) has an electrode portion (404+405; fig. 4b; col. 7, line 45 to col. 8, line 4) having a thickness larger than the average thickness of the coating film (407) (see fig. 4b),
    - a thickness of a part of the coating film (the left portion of right 407 or the right portion of the left 407) which is in contact with the electrode portion (404+405) is smaller than the average thickness of the coating film (407), and
    - the electrode portion (404+405) is provided outside of a power generation region (406b) of the photovoltaic element (the electrode portion is disposed on the non-power generating region 406a; see fig. 4b; col. 7, line 58 to col. 8, line 4),

- the photovoltaic element has collector electrodes (metallic wire 403; fig. 4b; col. 7, line 54 to col. 8, line 4) on the power generation region (406b), and the coating film (407) covers the power generation region (406b) and the collector electrodes (403) (407 covers the side surfaces of 403 and 406b).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 1-11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiotsuka et al. (US 6121542).

With respect to claim 1, Shiotsuka discloses a photovoltaic cell (see fig. 2a, col. 6, lines 40-56) comprising:

- a photovoltaic element (201) (fig. 2a; col. 6, lines 40-45); and
- a coating film (adhesive body 202 comprising polymer film 203 interposed between two adhesive materials 204) (fig. 2a; col. 6, lines 45-47) provided on the photovoltaic element (201),
    - wherein the photovoltaic element (201) has an electrode portion (collecting electrode 205 coated with adhesive 206) (fig. 2a; col. 6, lines 47-50) having a thickness of 25 micron to 1 mm (the thickness of the metallic wire or collecting electrode 205 with the circular cross section would be its diameter, which is preferably 25 micron to 1 mm; col. 11, lines 36-55; also the thickness of the adhesive 206 is 1 to 10% of thickness of the metallic wire, see col. 11, lines 31-35) and the coating film (202) having a thickness of 0.225 mm or 225 micron (the thickness of the coating film is 0.225 mm; see col. 10, lines 3-13),
    - a thickness of a part of the coating film (the portion of 202 on which 205+206 is disposed) which is in contact with the electrode portion (205) is smaller than the average thickness of the coating film (the electrode portion 205 is disposed in the coating film 202 thereby reduces the thickness of the specific portion on which electrode portion is disposed; see fig. 2a), and
    - the coating film (202) does not cover a top surface of the electrode portion (205) (see fig. 2a which clearly shows the coating film is below

the electrode portion and thereby does not cover any of the top surface of the electrode portion 205).

The reference is silent as to whether the thickness of the electrode portion (205) is larger than the average thickness of the coating film (202). However, one reading Shiotsuka as a whole would have readily appreciated that the electrode portion (205) can have any thickness ranging from 25 micron to 1mm and the electrode portion needs a thickness larger than 225 micron to have a thickness larger than the average thickness of the coating film (202). In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. See *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). See also MPEP § 2144.05 I. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized a thickness greater than 225 micron for the electrode portion (205) such that the thickness of the electrode portion (205) is larger than the average thickness of the coating film (202).

With respect to claim 2, Shiotsuka further discloses that the coating film comprises a thermosetting coating material (thermoplastic resin; col. 12, lines 27-33 and 41-44), but silent as to whether any of these thermosetting coating materials before curing has a viscosity in the range of from 1 to 50 mPa-s. However, the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See MPEP § 2144.07.

With respect to claim 3, Shiotsuka further discloses that the average thickness of the coating film is 0.225 mm (col. 10, lines 2-13).

With respect to claim 4, Shiotsuka further discloses that the coating film (202) comprises a coating material (adhesive material 204) containing at least an acrylic resin (col. 10, lines 52-55).

With respect to claim 5, Shiotsuka further discloses that the coating film comprises a coating material (adhesive material 204; col. 10, lines 42-64) and electrode portion comprises an insulating member (insulating coating material such as urethane resin or other thermoplastic resin in electrically conductive adhesive 206; col. 12, lines 34-44) and a conductive foil body (metal wire 205; col. 11, lines 8-12).

With respect to claim 6, Shiotsuka further discloses that the insulating member comprises an acrylic adhesive layer (col. 12, lines 41-44).

With respect to claim 7, Shiotsuka further discloses that a part of the insulating member (insulating material such as urethane resin or other thermoplastic resin in electrically conductive adhesive 206; col. 12, lines 34-44) located at a position higher than the average thickness of the coating film (Examiner notes that 206 is disposed above the coating film 202 and thereby located at a higher position) has a low wettability to the coating material (adhesive material 204) (since the coating material 204 is made of silicone resin which as low wettability or low moisture absorption as shown in col. 10, lines 55-57, the insulating material in the conductive adhesive 206 will have low wettability to the coating material).

With respect to claim 8, Shiotsuka further discloses that a side surface of the insulating member (outer surface of conductive adhesive 206 which includes insulating material) comprises an agent (thermoplastic resin; col. 12, lines 27-33 and 41-44) causing the side surface of the insulating member to have a low wettability to the coating material (adhesive material 204), the side surface of the insulating member being located at a side of the electrode portion which is in contact with the coating film (at the lower portion of electrode 205 which is in contact with the coating film 202; see fig. 2a).

With respect to claim 9, Shiotsuka further discloses that the insulating member includes a base plate comprising the agent (the outer surface of 206 which comprises thermoplastic resin; col. 12, lines 27-33 and 41-44).

With respect to claim 10, Shiotsuka discloses a method for manufacturing a photovoltaic element (201; fig. 2a; col. 6, lines 40-56) and a coating film (adhesive body 202 comprising polymer film 203 interposed between two adhesive materials 204) (fig. 2a; col. 6, lines 45-47) provided on the photovoltaic element (201), comprising:

- a step of forming the coating film (202) on a light receiving face (top face) of the photovoltaic element (201) by applying the coating film (202) thereon; and
- a step of heating (heat treatment; col. 10, lines 58-64) the coating film (202) for curing while a part (the adhesive material 204 which is in contact with the electrode portion 205+206) thereof in contact with an electrode portion (collecting electrode 205 coated with adhesive 206)

(fig. 2a; col. 6, lines 47-50) of the photovoltaic element (201) is being maintained to give an electrode portion with a thickness of 25 micron to 1 mm (the thickness of the metallic wire or collecting electrode 205 with the circular cross section would be its diameter, which is preferably 25 micron to 1 mm; col. 11, lines 36-55; also the thickness of the adhesive 206 is 1 to 10% of thickness of the metallic wire, see col. 11, lines 31-35) and coating film (202) with a thickness of 0.225 mm or 225 micron (the thickness of the coating film is 0.225 mm; see col. 10, lines 3-13),

- where the coating film (202) does not cover a top surface of the electrode portion (205) (see fig. 2a which clearly shows the coating film is below the electrode portion and thereby does not cover any of the top surface of the electrode portion 205).

The reference is silent as to whether the thickness of the electrode portion (205) is larger than the average thickness of the coating film (202). However, one reading Shiotsuka as a whole would have readily appreciated that the electrode portion (205) can have any thickness ranging from 25 micron to 1mm and the electrode portion needs a thickness larger than 225 micron to have a thickness larger than the average thickness of the coating film (202). In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. See *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). See also MPEP § 2144.05 I. Therefore, it would have been obvious to one of ordinary skill in the art at the time of

the invention to have utilized a thickness greater than 225 micron for the electrode portion (205) such that the thickness of the electrode portion (205) is larger than the average thickness of the coating film (202).

With respect to claim 11, Shiotsuka further discloses that the method further comprises a step of coating a side surface of an insulating member of the electrode portion (outer surface of conductive adhesive 206 which includes insulating material and contacts adhesive material 204; col. 12, lines 34-44) with an agent (with adhesive material 204; see fig. 2a) which causes the side surface of the insulating member to have a low wettability to a coating material (adhesive material 204) (the coating material is made of silicone resin as shown in col. 10, lines 55-57, which has low moisture absorption, i.e., low wettability) contained in the coating film (202), wherein the side surface of the insulating member is located at a side of the electrode portion which is brought into contact with the coating film (at the lower portion of electrode 205 which is in contact with the coating film 202, more specifically with the adhesive material 204 of the coating film 202; see fig. 2a).

With respect to claim 13, Shiotsuka further discloses that the method further comprises a step of forming an insulating member (the insulating material of the conductive adhesive 206; col. 12, lines 34-44) of the electrode portion by slitting a tape (the adhesive 206 which is cut at the top surface that contacts the bus bar 207; see fig. 2a) comprising a base plate (the outer surface of 206 which contacts 207), wherein the base plate and a side surface (outer surface of conductive adhesive 206 which contacts the adhesive material 204; see fig. 2a) of the insulating member comprise an agent

(insulating material such as thermoplastic resin; col. 12, lines 34-44) which causes the side surface of the insulating member to have a low wettability to a coating material (adhesive material 204) contained in the coating film (202), and wherein the side surface of the insulating member is located at a side of the electrode portion (205) which is brought into contact with the coating film (at the lower portion of electrode 205 which is in contact with the coating film 202, more specifically with the adhesive material 204; see fig. 2a).

10. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shiotsuka as applied to claim 1 above, and further in view of Nakamura et al. (US 6291763, cited in previous office action).

Applicant is directed above for complete discussion of claim 1 in view of Shiotsuka. Shiotsuka further discloses that the coating film comprises a thermosetting coating material (thermoplastic resin; col. 12, lines 27-33 and 41-44), however is silent as to whether any of these thermosetting coating materials before curing has a viscosity in the range of from 1 to 50 mPa.s.

Nakamura discloses a photoelectric conversion device and photocell (col. 1; lines: 5-8) and further discloses coating material with a viscosity of I mPa.s (col. 7; lines 6-8). Nakamura teaches that the liquid viscosity is largely dependent on the kind and dispersibility of the semiconductor particles, the solvent, additives, and a binder in order to form a uniform film extrusion coating or casting (col. 7; lines: 4-9).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate a liquid viscosity of 1 mPa.s for the coating material as taught

by Nakamura to the photovoltaic cell of Shiotsuka in order to form a uniform film coating.

11. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shiotsuka as applied to claim 10 above, and further in view of Bearinger et al. (US 5611884).

Applicant is directed above for complete discussion of claim 11 in view of Shiotsuka. Shiotsuka further discloses that the agent is a release agent (silicone resin; col. 10, lines 42-57), but silent to as to whether the agent is contained in a mixed solution at a concentration of 0.1 to 30 percent.

Bearinger discloses an adhesive material comprising an agent (silicone resin) mixed in a solution with at a concentration of 25.85% (col. 7, line 42 to col. 8, line 6) to allow for an adhesive material with good cohesive strength and excellent adhesion (col. 8, lines 4-6).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have used the silicone resin of Bearinger contained in the solution at a concentration of 25.85% in the method of Shiotsuka to allow for good cohesive strength and excellent adhesion as taught by Bearinger.

Response to Arguments

12. Applicant's arguments with respect to claims 1-14 have been considered but are moot in view of the new ground(s) of rejection.

Due to Applicant's amendment to claims 1 and 10, a new ground(s) of rejections is made in view of Shiotsuka.

Claim Rejections under 35 U.S.C. 102(b) and 35 U.S.C. 103(a)

Claims 1-14

With respect to claims 1 and 10, Applicant argues that "According to a feature of the invention as recited by Claims 1 and 10, the coating film does not cover a top surface of the electrode portion" (see Remarks, page 6).

This argument is directed to amended claims 1 and 10, and a new ground(s) of rejection is made in view of Shiotsuka.

With respect to claim 14, Applicant argues that "Shiotsuka also is not seen to disclose or suggest the above-discussed features recited by Claim 14. The Examiner takes the position that Shiotsuka's metallic wire 406(a) and coating layer 406(b) correspond, respectively to the electrode portion and coating film of the present invention. However, Applicants respectfully submit that the coating layer 406(b) is provided inside of a power generation region of the photovoltaic element. See Fig. 4 of Shiotsuka. Further, Applicants respectfully submit that the coating layer 406(b) does not cover the power generation region and the collector electrodes" (see Remarks, page\s 6-7).

This argument is moot in view of new ground(s) of rejection (see above).

Correspondence/Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GOLAM MOWLA whose telephone number is (571) 270-5268. The examiner can normally be reached on M-F, 0900-1700 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, ALEXA NECKEL can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/G. M./
Examiner, Art Unit 1795

/Alexa D. Neckel/

Supervisory Patent Examiner, Art Unit 1795